CLAIMS

1. A method of facilitating the crystallisation of a macromolecule comprising the step of adding a mesoporous glass to a crystallisation sample wherein the mesoporous glass comprises pores having diameters between 4nm and 100nm and has a surface area of at least 50 m^2/g.

2. A method of facilitating the crystallisation of a macromolecule comprising the step of adding to a crystallisation sample a mesoporous glass of the composition SiO_2; $CaO-P_2O_5-SiO_2$ or $Na_2O-CaO-P_2O_5-SiO_2$,

wherein each of the Ca, P, Si or Na atoms within the compositions may be substituted with a suitable atom chosen from B, Al, Ti, Mg, or K,

and, optionally, the composition may also include heavy elements to enhance X-ray diffraction contrast such as Ag, Au, Cr, Co, Sr, Ba, Pt, Ta or other atom with an atomic number over 20.

3. A method according to Claim 2 wherein mesoporous glass is of the composition SiO_2; $CaO-P_2O_5-SiO_2$ or $Na_2O-CaO-P_2O_5-SiO_2$.

4. A method according to Claims 2 or 3 wherein the mesoporous glass comprises pores having diameters between 2nm and 200nm.

5. A method according to Claim 4 wherein the diameter of the pores has a standard deviation of at least 10nm.

6. A method according to any of the above claims wherein the mesoporous glass has interconnected pores that intersect with the surface of the glass.

7. A method according to any one of the previous claims wherein crystallisation of the macromolecule is induced at a lower critical level of super saturation than that obtained where the mesoporous glass is not added to the sample.

8. A method of preparing a mesoporous glass as defined in relation to claim 1 or 2 for use as a nucleant in crystallisation comprising fracturing said material into pieces of sub-millimetre dimensions.

9. A method according to claim 8 wherein the pieces are no more than 200 micron in any dimension.

10. A method according to claim 9 wherein the pieces are no more than 100 micron in any dimension.

11. A method according to any one of claims 8 to 10 wherein the fracture is by cutting with a scalpel or mechanical means (diamond cutter) or breaking smaller pieces off a larger one using tweezers, or crushing with a low load.

12. A method of determining the structure of a macromolecule comprising the steps of:

(i) crystallising the macromolecule in the presence of a mesoporous glass as defined in relation to claim 1 or 2; and,

(ii) analysing the crystal structure of the crystal produced in step (i).

13 A chamber suitable for crystallising a macromolecule, or a fibre, film or mesh, wherein said chamber, fibre, film or mesh comprises a mesoporous glass as defined in relation to claims 1 or 2

14 A chamber, fibre, film or mesh according to claim 13 wherein the mesoporous glass forms a coating on the chamber, fibre, film or mesh.

15. Use of a mesoporous glass as defined in relation to claim 1 or 2 or a chamber, fibre, film or mesh according to claims 13 or 14 in the crystallisation of a macromolecule.

16. A kit of parts comprising a crystallisation agent and a mesoporous glass as defined in relation to claim 1 or 2 or a chamber as defined in claim 13 or 14.

17. An automated method of crystallising a macromolecule comprising adding a mesoporous glass as defined in relation to claim 1 or 2 to a crystallisation trial using an automated dispensing system.

18. A method according to Claim 17 wherein the crystallisation is in a screen or optimisation.

19. A method according to Claim 17 or 18 wherein the mesoporous glass is added as a suspension in a liquid.

20. A method according to Claims 1 to 3 or 12 or 17 to 19 or a use according to Claim 13 or a kit according to any one of Claims 14 to 16 wherein the mesoporous glass as defined in relation to claim 1 or 2 is prepared according to the method of any one of Claims 8 to 11.

21. A crystal obtainable or obtained by the method of any one of Claims 1 to 3 or 17 to 21.

22. A method according to Claim 1 to 3 or 12 or 17 to 19 or a use according to Claim 13 or a crystal according to Claim 21 wherein the macromolecule is a biological macromolecule.

23. A method or use according to Claim 22 wherein the macromolecule is a protein.

24. Use of an automated liquid dispensing system to dispense a porous mesoporous glass according to the method of Claim 19.